CHAPTER 10 – DESIGN SERVICES COORDINATION AND QUALITY ASSURANCE

SECTION 10.1 GENERAL

All firms providing professional services to the University are expected to strive for a standard of excellence in planning, design and construction administrative services. To that end, an active quality assurance program is essential to the process of continual improvement.

The Quality Assurance Process outlined in this chapter provides guidance to assist the A/E in reviewing the documents and represents the minimum information that the University expects to be shown on the drawings to clearly identify the work to be performed.

The contract documents submitted shall represent a reasonable and cost effective architectural and engineering solution for the scope of work and construction budget in the A/E contract.

SECTION 10.2 QUALITY ASSURANCE PROCESS

10.2.1 Reviews

The A/E shall perform a quality assurance review for both the technical accuracy and discipline coordination. Items such as sections, details, note references, major dimensions and equipment locations shall be checked. Verify that all equipment is consistently identified on all sheets and in the specifications and cost estimate.

10.2.2 Checking of Submittal Elements

All elements of submittals shall be checked by the A/E: Each check should be made by persons other than those preparing the materials and by professional personnel trained in that specific discipline. Fire alarm and sprinkler submittals will be reviewed by the various disciplines in DEB for compliance with requirements and standard criteria. Errors and deficiencies shall be corrected by the A/E at no additional cost to the University.

SECTION 10.3 QUALITY PROCESS

10.3.1 Quality Reviews

When applicable, the following reviews should be considered as components of an overall Quality Assurance Process for each project.

10.3.1.1 - Program: Develop/validate the program requirements to ensure the project meets the client's needs.

10.3.1.2 - Budget: Develop/validate a cost model for each discipline to work toward and review at each submission. Coordinate with the university Project Manager on budgetary items that fall outside of the construction value (CV) that must be accounted for in the total project value (PV).

10.3.1.3 - Schedule: Develop a reasonable project schedule and continually review and revise as necessary.

10.3.1.4 - Individual Discipline Technical Reviews: Ensure technical adequacy of each discipline.

10.3.1.5 - Interdisciplinary Coordination: Ensure all trades are coordinated with each other.

10.3.1.6 - Code Review: Ensure minimum standards for health, life safety, energy, etc. are met.

10.3.1.7 - Constructability Review: Ensure that the building systems can be constructed as indicated and within the allotted space indicated.

10.3.1.8 - Phasing Review: Ensure that the building can remain occupied (as applicable) during construction and that all means of egress and all required building systems remain functional for safe occupancy.

SECTION 10.4 PURPOSE

10.4.1 Quality Assurance

Quality Assurance is a systematic process of applying quality control to the planning, design and execution of a project. With a quality assurance program that is properly administered, a win- win-win occurs for the Owner, Contractor and A/E when the potential for change orders, time extensions and liability claims are all reduced. Specific benefits are identified as follows:

10.4.1.1 - Planning: Ensuring that the needs of the client can be met within the allotted time and budget.

10.4.1.2 - Design: Providing a set of quality construction documents will:

- Attract quality Contractors and allow the best pricing in a competitive construction market
- Minimize change orders and unanticipated expenses for all parties.
- Allow the best opportunity for an accurate cost estimate
- Minimize unnecessary delays and conflict in the execution of the project

10.4.1.3 - Cost Modeling/Estimating: Project funds are typically tight and allow little room for error.

- Properly estimating the project and adhering to a cost model will minimize the possibility of unplanned expenses over and above the project budget. Additional time delays and effort necessary to bring a project into budget after the design is complete can be avoided.

10.4.1.4 - Construction Administration: Quality Assurance will ensure:

- Document version control, schedules, as-built drawings and all required logs are maintained properly
- Requests for information, proposals, change order proposals, change orders and pay applications are all tracked and processed efficiently
- A proactive process of identifying issues and documenting the resolution
- Ensure that lessons learned are only learned once.

SECTION 10.5 PRE-DESIGN PHASE

10.5.1 Pre-Design Conference

See Chapter 9

10.5.2 Pre-Design Planning and Program Validation

Approximately 80% of a project's potential to succeed or fail is determined within the first 20% of the project. It is at this phase of the project that the scope, schedule and budget are established. For this reason, the A/E must take a very active role in the validation and ownership of the plan and validate portions of the project's POR documentation. Specifically, the following should be considered at the beginning of each project:

10.5.2.1 - Scope: Validate the scope with the client to ensure it meets the program requirements and can fit within the project budget and schedule.

- Identification of codes to be utilized throughout the project
- Determination and proposed resolution of code and/or safety related issues identified in the pre-design site investigation.
- Determine if there are any specific or unusual design requirements or design guides required to satisfy owner, requirements.
- Identify safety equipment and/or procedures required to operate and maintain the facility as intended, comply with OSHA and any other related safety standards.
- Review and validate the project program with University PM and end user.
- Review the project scope against the budget and schedule to validate that the project can be constructed within available funds and within the projected time frame.
- Identify project related expenses and "work by owner" that will need to be identified, coordinated, scheduled and budgeted for. Such work may include, but not be limited to: moving; storage; security; parking coordination; data and telephone; temporary facilities; furnishings; landscaping; etc.

10.5.2.2 - Budget: Validate the project budget and establish a cost model for each discipline to design to.

- Due to the State budget development process, the approved project budget may not reflect recent developments and cost adjustments within the construction industry.
- Budget discrepancies must be identified as early as possible.
- Delays in the design or permitting of a project can be directly translated to construction cost increases. It is therefore imperative that the design team be able to develop and execute the design in a timely manner.

10.5.2.3 - Schedule: Validate the project schedule to ensure that it is realistic for both the design and construction phases and that it can be supported by the design team.

- Prepare a Gantt chart indicating detailed pre-design, design and procurement activities. Construction activities shall be shown as one or more activities depending on the required project phasing (if applicable).
- Schedule discrepancies must be identified as early as possible.

- Ensure that sufficient time is programmed for the quality review at each submittal.
- Ensure that sufficient time is programmed for owner activities such as Value Engineering, reconciling cost estimates and permitting.
- Ensure that all phases of the design schedule and major construction milestones are coordinated with the academic calendar and user requirements
- Obtain buy-in from all stakeholders.

10.5.3 Pre-Design Investigative Site Visits

A pre-design site visit by representatives of each discipline relative to the project shall be scheduled to occur immediately following the pre-design kickoff meeting.

10.5.3.1 - Interviews: As applicable, site visits shall include field investigations and interviews with the University PM and project stakeholders, including, but not limited to, representatives from the Maintenance, Utilities, and Grounds departments. Specifics to be included in site investigation may include, but are not limited to:

- Code related and/or safety issues in existing facilities that need to be updated and/or installed as a part of the project. Examples may include outdated fire alarm systems, sprinkler systems, egress paths, accessibility, integrity of existing fire rated assemblies, etc.
- Code related issues that may present difficulties throughout the project, examples include maintaining existing code mandated life safety systems, fire ratings and egress paths in existing buildings intended to remain occupied during construction.
- Identify unknowns and determine if destructive testing will be required to reasonably assess existing conditions
- Review of record drawings
- Initial field surveys including topo, wetland and/or utility surveys, hazardous material survey, geotechnical survey as may be appropriate.

SECTION 10.6 DESIGN PHASE

10.6.1 Program

At the kick-off meeting for each phase of the design, the A/E and University PM shall review the program with the stakeholders and determine if any changes to the program are required. All changes to the program and project requirements shall be documented through a POR revision.

10.6.1.1 Potential changes: could result from

- Previous review comments
- Change in owner requirements
- Elimination of unauthorized scope creep
- Identification of inflation over and above anticipated escalation
- Proactive changes required to maintain the project cost model
- Changes due to Value Engineering etc.

10.6.2 Design Phase Communication Protocols

At the kick-off meeting for each phase of the design, validate and adjust as necessary the established communication protocols.

- Solicit feedback from all team members and stakeholders to ensure that established protocols are effective
- Ensure that all team members as well as all stakeholders are aware of the protocols.

10.6.3 Design Phase Budget

At the kick-off meeting for each phase, validate the project budget based on the most recent cost estimate.

- Each phase of the project design shall be designed to a cost model which shall account for escalation to the mid-point of the anticipated construction period.
- Adjust the escalation at each design phase to account for any delay in the design process to date.
- See Appendix M for design contingency. This design contingency shall be released only as authorized by the University PM during the development of design.
- An independent cost estimate shall be required for all projects over $2,000,000 in estimated construction value
    - Requests to waive the requirement for an independent cost estimate shall be submitted to the University Architect for consideration in the form of a “Determination and Findings”.
    - For every project utilizing an independent cost estimator, the cost estimate provided by the A/E shall be reconciled with the cost estimate provided by the independent cost estimator.
    - The independent cost estimate shall be considered reconciled with the A/E cost estimate when the total project cost, as well as every major division is within 10% of the A/E cost estimate.
    - The cost of reconciling each cost estimate shall be included within the A/E fee as a cost not to exceed, additional service.
- The project shall not proceed to the next design phase until the cost estimate is validated with the cost model and the independent cost estimate.

10.6.4 Design Phase Schedule

The schedule shall be coordinated with the University Project Manager and shall include as a minimum the following items as applicable.

- Significant event meetings such as:
    - Pre-design conference
    - Presentations to the Building committee, DRB, AARB
- Studies as applicable such as:
    - Environmental Impact Study
    - Geotechnical Report
    - Archaeology Study
    - Value Engineering Study
    - Building Envelope Study
- Individual Design Phases
- University Reviews including:
    - Review and reconciliation of project scope, schedule and budget
    - Client review

  - Code review
  - University Architect review
  - Facilities Operations review
  - EH&S review
- A/E responses and resolution owner comments at each design phase

10.6.5 Design Phase Field Investigations

Design phase field investigations shall include:

- Photographic documentation of existing conditions
- Conference Summaries of each meeting held
- Validation of existing field conditions as they relate to the project. Validation to include existing building structure and other elements that may interfere with new or extended utilities

10.6.6 Design Phase Running Action List

A running action list tracking outstanding activities, suspense dates and responsible party shall be developed and maintained by the A/E.

- The action list shall be distributed to the University PM for confirmation and feed back
- Updates shall occur on a regularly scheduled basis as directed by the University PM

10.6.7 Design Phase Technical Review

Calculations shall be organized by discipline and presented for internal peer review. Refer to chapter 9 and associated appendix for required calculations.

SECTION 10.7 CONSTRUCTION PHASE

10.7.1 Requests for Information

Maintain a procedure for tracking, processing and logging Requests for Information, Requests for Proposal, clarifications, supplemental instructions and similar documents. Procedure shall ensure that processing and responses are timely.

10.7.2 Applications for Payment

Maintain a procedure for reviewing and processing Applications for Payment in a timely manner, including the scheduling and administration of payment meetings.

10.7.3 Progress of the Work

Maintain a procedure for monitoring the progress of the work with respect to the project schedule. Maintain a running list of issues and actions required and performed.

10.7.4 Shop Drawings and Submittals

Maintain a procedure for logging, processing and tracking shop drawing submittals to assure that submittals are made and reviews are returned in a timely manner so as not to delay the work.

10.7.5 Monitoring Construction Activities

Maintain a procedure for monitoring ongoing construction activities to ensure compliance with the contract documents and applicable codes, including the timely issuance of reports.